

Appl. No. 10/065,169
Amdt dated August 12, 2004
Reply to Office Action of May 06, 2004

Amendments to the Claims

This listing of claims will replace all prior versions and listing of claims in the application:

Listing of Claims:

1. (currently amended) A redundancy unit comprising:
a first fuse block comprising at least one first-type fuse, the first-type fuse is used for programming the redundancy unit prior to packaging;
a second fuse block comprising at least one second-type fuse, the second-type fuse is used for programming the redundancy unit after packaging;
a passive selection circuit including first and second input terminals, the first input terminal coupled to the first fuse block, the second input terminal coupled to the second fuse block; and
a redundant element coupled to the first and second fuse blocks via the passive selection circuit, the passive selection circuit passes information stored in the first fuse block if the first fuse block has been programmed or passes information stored in the second fuse block if the second fuse block has been programmed ~~the redundant element can be programmed by either the first or second fuse blocks.~~
2. (original) The redundancy unit of claim 1 repairs defects in an integrated circuit.
3. (original) The redundancy unit of claim 1 wherein the redundant element repairs defects in a memory array.

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4. (original) The redundancy unit of claim 3 wherein the redundant element comprises a memory cell.
5. (original) The redundancy unit of claim 3 wherein the redundant element comprises memory cells for row redundancy.
6. (currently amended) The redundancy unit of claim 3 wherein the redundant element comprises a memory cells for column redundancy.
7. (previously presented) A redundancy unit comprising:
a first fuse block comprising at least one first fuse;
a second fuse block comprising at least one second fuse; and
a redundant element coupled to the first and second fuse blocks, the redundant element can be programmed by either the first or second fuse blocks, wherein the first fuse comprises a laser blowable fuse and the second fuse comprises an electrical fuse.
8. (currently amended) The redundancy unit of claim 7 further comprises a passive selection circuit coupled to ~~between~~ the first and second fuse blocks and ~~the~~ redundant element, the passive selection circuit selecting either the first or second fuse block for programming the redundancy unit.
9. (original) The redundancy unit of claim 8 wherein the selection circuit comprises an OR or an XOR gate.

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10. (currently amended) The redundancy unit of claim 7 wherein the electrical fuse comprises an electrical blowable fuse.
11. (currently amended) The redundancy unit of claim 10 further comprises a passive selection circuit coupled to ~~between the first and second~~ fuse blocks and ~~the redundancy~~ element, the passive selection circuit selecting either the first or second fuse block for programming the redundancy unit.
12. (previously presented) The redundancy unit of claim 11 wherein the selection circuit comprises an OR or an XOR gate.
13. (currently amended) The redundancy unit of claim 7 wherein the electrical fuse comprises an anti-fuse.
14. (currently amended) The redundancy unit of claim 13 further comprises a selection circuit coupled to ~~between the first and second~~ fuse blocks and ~~the redundancy~~ element, the selection circuit selecting either the first or second fuse block for programming the redundancy unit.
15. (previously presented) The redundancy unit of claim 14 wherein the selection circuit comprises an OR or an XOR gate.
16. (currently amended) A redundancy unit comprising:
a first fuse block comprising at least one first fuse;

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a second fuse block comprising at least one second fuse;
a redundant element coupled to the first and second fuse blocks, the redundant element can be programmed by either the first or second fuse blocks; and
a passive selection circuit coupled to ~~between the~~ first and second fuse blocks and the ~~redundant~~ redundancy element, the passive selection circuit selecting either the first or second fuse block for programming the redundancy unit.

17. (original) The redundancy unit of claim 16 wherein the selection circuit comprises an OR or an XOR gate.
18. (currently amended) The ~~redundancy~~ unit ~~of any one of claims 2[-6]~~ wherein the first-type fuse comprises a laser blowable fuse and the second-type fuse comprises an electrical fuse.
19. (currently amended) The redundancy unit of claim 18 wherein the first fuse block further includes a master fuse, the master fuse indicating whether or not the redundancy unit has been programmed by the first fuse block ~~further comprises a selection circuit coupled to between the fuse blocks and redundancy element, the selection circuit selecting either the first or second fuse block for programming the redundancy unit.~~
20. (currently amended) The redundancy unit of claim ~~19~~ 18 wherein the passive selection circuit comprises an OR or an XOR gate.

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21. (currently amended) The redundancy unit of any one of claims 2-6 wherein the passive selection circuit comprises an OR or an XOR gate ~~further comprises a selection circuit coupled to between the fuse blocks and redundancy element, the selection circuit selecting either the first or second fuse block for programming the redundancy unit.~~

22. (currently amended) The redundancy unit of claim 21 ~~2~~ wherein the first fuse block further includes a master fuse, the master fuse indicating whether or not the redundancy unit has been programmed by the first fuse block ~~the selection circuit comprises an OR or an XOR gate.~~

23. (previously presented) A redundancy block which includes x number of redundancy units, wherein x is a whole number greater than 1, the redundancy block comprises:
y number of first redundancy units, wherein y is a whole number greater than or equal to 1, but less than or equal to x, wherein a first redundancy unit includes

a first redundancy unit first fuse block comprising at least one first-type fuse;

a first redundancy unit second fuse block comprising at least one second-type fuse; and

a first redundancy unit redundant element coupled to the first and second fuse blocks, the redundant element can be programmed by either the first redundancy unit first or second fuse blocks; and

z number of second redundancy units, wherein z is a whole number and is equal to x-y, wherein a second redundancy unit includes

a second redundancy unit fuse block comprising at least one first-type fuse

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a second redundancy unit redundant element coupled to the second redundancy unit fuse block, the second redundancy unit redundant element can be programmed by the second redundancy unit fuse block.

24. (currently amended) The redundancy block of claim 23 is incorporated into an integrated circuit.

25. (currently amended) The redundancy unit of claim 23 or 24 wherein the first-type fuse comprises a laser blowable fuse and the second-type fuse comprises an electrical fuse.

26. (currently amended) The redundancy unit of claim 25 further comprises a passive selection circuit coupled to ~~between the~~ first and second fuse blocks and ~~the redundancy~~ element, the passive selection circuit selecting either the first or second fuse block for programming the redundancy unit.

27. (currently amended) The redundancy unit of claim 23 or 24 further comprises a passive selection circuit coupled to between the fuse blocks and redundancy element, the passive selection circuit selecting either the first or second fuse block for programming the redundancy unit.

28. (new) The redundancy unit of claim 27 wherein the passive selection circuit comprises an OR or an XOR gate.

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29. (new) The redundancy unit of claim 26 wherein the passive selection circuit comprises an OR or an XOR gate.
30. (new) The redundancy unit of claim 22 further comprises a gating circuit, the gating circuit coupled to the second fuse block and the master fuse of the first fuse block, the gating circuit decoupling the second fuse block from the passive selection circuit when the master fuse indicates that the first fuse block has already been programmed.
31. (new) The redundancy unit of claim 30 wherein the gating circuit comprises an AND gate.
32. (new) The redundancy unit of claim 22 wherein the passive selection circuit comprises an OR or an XOR gate.
33. (new) The redundancy unit of claim 32 further comprises a gating circuit, the gating circuit coupled to the second fuse block and the master fuse of the first fuse block, the gating circuit decoupling the second fuse block from the passive selection circuit when the master fuse indicates that the first fuse block has already been programmed.
34. (new) The redundancy unit of claim 33 wherein the gating circuit comprises an AND gate.
35. (new) The redundancy unit of claim 19 further comprises a gating circuit, the gating circuit coupled to the second fuse block and the master fuse of the first fuse

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block, the gating circuit decoupling the second fuse block from the passive selection circuit when the master fuse indicates that the first fuse block has already been programmed.

36. (new) The redundancy unit of claim 35 wherein the gating circuit comprises an AND gate.

37. (new) The redundancy unit of claims 19 wherein the passive selection circuit comprises an OR or an XOR gate.

38. (new) The redundancy unit of claim 37 further comprises a gating circuit, the gating circuit coupled to the second fuse block and the master fuse of the first fuse block, the gating circuit decoupling the second fuse block from the passive selection circuit when the master fuse indicates that the first fuse block has already been programmed.

39. (new) The redundancy unit of claim 38 wherein the gating circuit comprises an AND gate.

40. (new) A redundancy unit comprising:
a first fuse block comprising at least one first-type fuse, the first-type fuse is used for programming the redundancy unit prior to packaging;
a second fuse block comprising at least one second-type fuse, the second-type fuse is used for programming the redundancy unit after packaging;

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a passive selection circuit including first and second input terminals, the first input terminal coupled to the first fuse block, the second input terminal coupled to the second fuse block, the passive selection circuit comprising an OR or an XOR gate; and

a redundant element coupled to the first and second fuse blocks via the passive selection circuit, the passive selection circuit passes information stored in the first fuse block if the first fuse block has been programmed or passes information stored in the second fuse block if the second fuse block has been programmed.

41. (new) The redundancy unit of claim 40 further comprises a gating circuit, the gating circuit coupled to the second fuse block, the gating circuit decoupling the second fuse block from the passive selection circuit if the first fuse block has been programmed.

42. (new) The redundancy unit of claim 40 wherein the first fuse block further includes a master fuse, the master fuse indicating whether or not the redundancy unit has been programmed by the first fuse block.

43. (new) The redundancy unit of claim 42 further comprises a gating circuit, the gating circuit coupled to the second fuse block and the master fuse of the first fuse block, the gating circuit decoupling the second fuse block from the passive selection circuit when the master fuse indicates that the first fuse block has already been programmed.

44. (new) The redundancy unit of claim 43 wherein the gating circuit comprises an AND gate.

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45. (new) The redundant unit of claim 40 wherein the first-type fuse comprises a laser blowable fuse and the second-type fuse comprises an electrical fuse.
46. (new) The redundancy unit of claim 45 further comprises a gating circuit, the gating circuit coupled to the second fuse block, the gating circuit decoupling the second fuse block from the passive selection circuit if the first fuse block has been programmed.
47. (new) The redundancy unit of claim 45 wherein the first fuse block further includes a master fuse, the master fuse indicating whether or not the redundancy unit has been programmed by the first fuse block.
48. (new) The redundancy unit of claim 47 further comprises a gating circuit, the gating circuit coupled to the second fuse block and the master fuse of the first fuse block, the gating circuit decoupling the second fuse block from the passive selection circuit when the master fuse indicates that the first fuse block has already been programmed.
49. (new) The redundancy unit of claim 48 wherein the gating circuit comprises an AND gate.